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Microsoft in the Age of Networks

DATAMATION

MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

Why You Should Be Making IS Allies

Working With Business Unit Peers Is the Surest Way to the Top

Also in This Issue:

The Raging Battle on the UNIX Front

Where Open Systems Are Making Headway

Has the Mini Met Its M

MAY 1, 1990

VOLUME 36
NUMBER 9

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

COVER STORY

At Lithonia Lighting, IS strategy has been built on alliances with line management.

Why You Should Be Making IS Allies 26

BY JEFF MOAD Frustrated with trying to penetrate the executive suite and with pitching competitive advantage, IS executives are now pushing for partnerships with line managers to improve internal business processes. But will this new role pay off?

Cover photography by Superstock Inc.

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BY JOHN McMULLEN Ever since the IBM PC and compatibles industry started, Microsoft has been the leader in software. But as companies begin to hook their micros into networks, will Microsoft be able to maintain its preeminence?

Bill Gates, Microsoft's chairman and CEO, says the company is ready to meet the network challenge.

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We have a policy of decentralization and distribution, with coordination at the center.

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The Value of Peer-to-Peer Networking

Where does one find most top managers of information systems these days? If one used companies' annual reports as a guide, a couple of conclusions could be drawn—one correct for the time being, the other misleading.

It would be fair to say that most IS executives are not regarded as one of the top two or three guns at their enterprises. Few, if any, serve on their companies' boards of directors. A minority bear that exalted title of chief information officer—a moniker meant to bring its owner into the inner circle of chief executive, operating and financial officers.

It would be wrong, however, to assume that IS executives are just headquarters hermits, closeted with other officers of centralized functions and focused solely on managing their IS staffs. In fact, many are spending greater amounts of their time out of the office, teaming up with their peers—division presidents, etc.—to apply information technology in ways that will lift their organizations to new heights. IS executives have determined that such altitudes, if reached, will go a lot further than fancy titles in bringing them closer to the inner sanctum of management at their corporations.

Photographs by David Bradley

MOAD (left) AND McMULLEN teamed up on communications issues.

Locating the locus of power for IS brass challenged senior writer Jeff Moad, who prepared this issue's cover story, "Team Leader: A Bold New Image for IS Execs." His assignment began as an investigation into how the best IS managers in the world are able to communicate the value of their activities to CEOs. Past encounters with enlightened IS chiefs had persuaded us that they possessed unique presentation and marketing skills enabling them to sell technology solutions to the top brass. The more Moad probed the issue, however, the more he found executives spending their time communicating with peers—not creating slide shows for boardroom reviews.

Microsoft's Future in Networking

Another member of the DATAMATION team faced a challenge equally as daunting as Moad's in this issue. Associate editor John McMullen drew our third strategic supplier profile assignment for 1990—the first two being our special reports on IBM in January and Digital Equipment Corp. in March. Although his target, $1 billion Microsoft Corp., isn't nearly as large as Big Blue or Digital, changes occurring at the desktop software leader gave McMullen plenty to assess. He came away from Microsoft with a look not only at where MS-DOS and Excel's creator is today but where chairman William Gates is leading his teams of programmers in the future in "Microsoft in the Age of Networks," page 36.

Tim Mead

Tim Mead, Editor-in-Chief

DATAMATION

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A New LAN Standard Lights the Way

FDDI, a new standard for fiber optic networks, is ready to illuminate the LAN landscape. While most network managers eagerly await a flood of new products, naysayers fear that FDDI is already out of date.

BY STEPHEN A. CASWELL

From the basic description, you'd think FDDI was a Cecil B. deMille movie: seven years in the making, anxiously awaited by thousands and coming soon to a stage near you. Although it's not likely to create the same stir as *The Ten Commandments* or be *The Greatest Show on Earth*, FDDI—the Fiber Distributed Data Interface standard—certainly will add drama to a market long starved for a high-speed local area network communications standard.

FDDI was designed within the American National Standards Institute (ANSI) Committee X3T9.5 by several dozen participating computer and telecommunications companies. This alone makes FDDI special because it's the first mainstream local area network (LAN) standard that was developed by the industry as a whole. In contrast, other ANSI LAN standards, such as Ethernet (802.3) and Token Ring (802.5) were developed by vendors and adopted as standards by ANSI because of their widespread implementation in the field.

FDDI products are barely out of the box, and already the standard has the support of more than 80 leading telecommunications and computer companies worldwide. Furthermore, say analysts, the FDDI standard has strong user appeal. In order for a proprietary LAN solution to beat out FDDI, there will have to be a compelling reason.

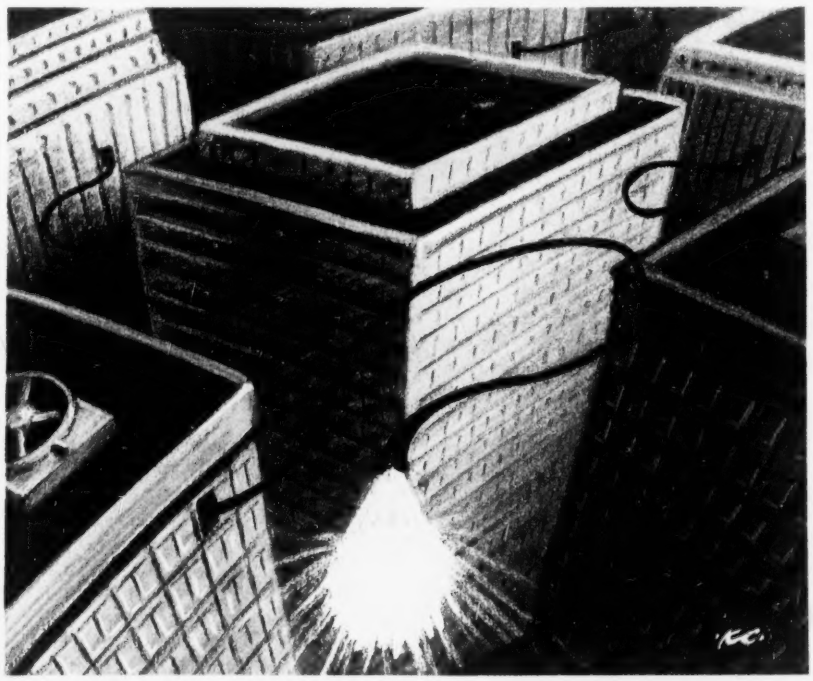


Illustration by Ken Condon

Yet a few nagging questions remain, particularly concerning the role FDDI will play in most organizations and the length of time it will last in the marketplace. FDDI, after all, has already taken a long time to reach users. Is it already outdated or does it have a big role to play—and where?

FDDI Basics

FDDI uses a token-passing access scheme on optical fiber media to achieve a speed of 100 megabits per second (Mbps), which is an order of magnitude faster than Ethernet's speed of 10Mbps. FDDI also has network station management capabilities baked right into the protocol, which is viewed as a critical benefit to companies that function in a multivendor environment.

The FDDI standard itself has four components: Physical (PHY), which describes the physical connectors and cables; Physical Media Dependent (PMD), which describes the link protocol; Media Access Control (MAC), which describes the peer-to-peer protocol between nodes; and Station Management (SMT), which is the network management component.

The PHY, PMD and MAC specifications are already complete. The SMT component is in draft form and is expected to be completed by early 1991. Vendors, however, already have products on the market that they say adhere to the SMT draft specification and will be upgraded to the final specification. Synernetics Inc., an FDDI supplier in Billerica, Mass., recently announced formation of the SMT Development Forum to encourage a uniform implementation of the SMT specification.

When added together, the four components of FDDI map into the first two lay-

ers of the seven-layer Open Systems Interconnection Reference Model, although many people say that the MAC component has some of the intelligence that is normally associated with OSI's third layer.

With OSI support behind it, FDDI seems poised for ready market acceptance. "FDDI is a great deal for end users and the component manufacturers," says Kenneth Bosomworth, president of International Resource Development Inc., a market research firm in New Caanan, Conn. Yet LAN vendors' success at capitalizing on FDDI remains uncertain. According to Bosomworth, FDDI will create a "dog eat dog market based on price" for LAN vendors because most of the value will be supplied by chip and optoelectronics suppliers. This leaves little room for LAN suppliers to differentiate their products.

The Building Momentum

Although relatively few end-user products have been shipped, momentum for the FDDI market is starting to build rapidly. Advanced Micro Devices Inc. of Sunnyvale, Calif., which so far has developed the only FDDI chip set on the market, is leading the charge. In July 1989, AMD established the Advanced Networking Group among LAN developers and vendors.

The purpose of the group, says John Jaeger, product marketing manager for AMD's FDDI Supernet chip set, is to promote FDDI in the marketplace and to help vendors establish interoperability among different products, so that LAN nodes from a variety of vendors will all work together in a single installation.

☐ FDDI Is Seen As The Coming Standard For Corporate LAN Backbones.

According to Jaeger, there are now about 80 members of the Advanced Networking Group. The list reads like a Who's Who of the computer networking and telecommunications industry and includes giants such as AT&T, Hewlett-Packard Co., Sun Microsystems Inc., Sony Corp. of America, Toshiba America Inc., Unisys Corp. and Wang Laboratories Inc., along with several dozen LAN vendors and component suppliers.

Conspicuously missing from the list are Digital Equipment Corp. and IBM, although not being on the list does not necessarily signal a lack of company support for FDDI. Digital, for example, has already announced an FDDI product and has developed very large scale integrated circuits (VLSICs) for FDDI that it licensed AMD to manufacture for the general market. William Johnson, Digital's vice president of Distributed Systems, furthermore, has announced his firm's public support for FDDI.

IBM has made no announcements and doesn't comment on unannounced products. Yet Big Blue has publicly signed deals with Cisco Systems Inc. of Menlo Park, Calif.; Communication Machinery Corp. of Santa Barbara, Calif.; FiberCom Inc. of Roanoke, Va.; and Wellfleet Communications Inc. of Bedford, Mass. Each of these companies is expected to play an important role in the FDDI marketplace. Furthermore, IBM has said it is looking at FDDI and other high-speed LANs in its research laboratories in Raleigh, N.C., and Zurich, Switzerland.

Leader of the Pack

Although a number of vendors have announced new FDDI products and several are shipping products now, the acknowledged leader of the pack today is Hyannis, Mass.-based Fibronics International Inc., which can lay claim to 80 to 90% of the current installed base.

A Fibronics spokesman says the firm has 900 FDDI nodes installed in 70 companies worldwide. Installations include Argonne National Laboratory, Coors Brewing Co., General Motors Corp., Italian Autostrade, Martin Marietta Corp., Mitsubishi International, NASA Langley Research Center and TRW Inc.

Italian Autostrade, the government agency in charge of Italy's national highway system, has an application that shows the potential value of FDDI's increased speed of 100Mbps—automated toll booths that can capture billing data while cars pass by at about 30 miles per hour.

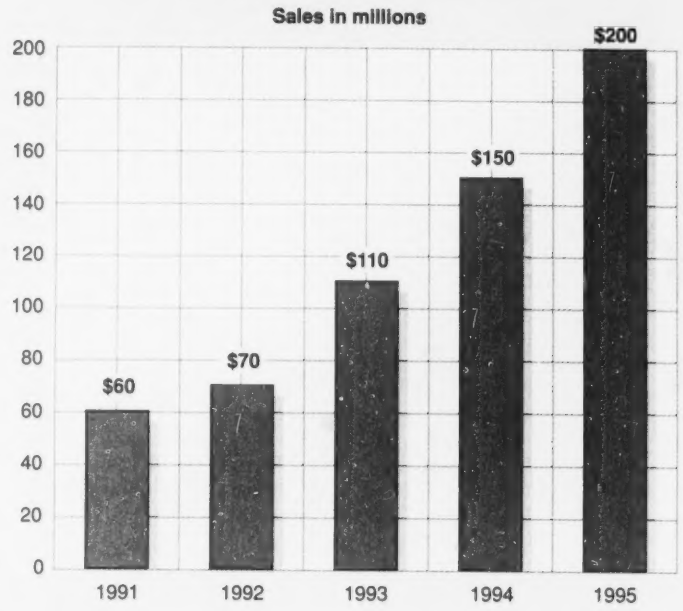
FDDI Takes Its Toll

The toll booths are connected via an FDDI backbone LAN directly to a mainframe computer. Drivers install a small box on the car's visor that sends credit card data via radio signals to the toll booth as the car passes by. The data are then posted to a central database at high speed. FDDI was required, according to a Fibronics spokesman, so that the mainframe doesn't miss a transaction.

Although Italian Autostrade's may be an exotic application, FDDI's bread and butter installations will be far more mun-

The Growing Demand for Fiber

Demand for FDDI subsystems will grow quickly over the next five years. But sales should peak in 1995 and decline thereafter.



Source: International Resource Development

dane. FDDI is viewed by virtually everyone in the market as the coming standard for corporate LAN backbones.

The National Aeronautics and Space Administration (NASA) Langley Research Center, a research and development arm of the government space organization based in Hampton, Va., is an example of how FDDI is likely to operate as a backbone. Ed Riddle, the head of the Communications and Network Systems Branch at NASA Langley, says he is pleased with FDDI technology. "We feel very good about its future."

☐ AN END USER COULD INADVERTENTLY END UP LOCKED INTO ONE SUPPLIER.

NASA Langley is a campus environment that comprises 100 buildings on four square miles. In 1985, says Riddle, 50 Ethernet LANs were installed and were interconnected via a 10Mbps Pronet 10 backbone network from Proteon Inc. of Westborough, Mass.

As the Pronet 10 backbone became saturated with traffic and required updating, Riddle says he compared a nonstandard solution—the newer 80Mbps Pronet 80 from Proteon—with the FX8210 FDDI LAN from Fibronics. Riddle's firm then purchased a Fibronics backbone to link two Ethernet LANs in NASA Langley's test lab and followed this with another FDDI backbone purchase to connect two more Ethernet LANs in a working field trial.

"We were surprised at how well it works," says Riddle. "[FDDI] is ideal for a backbone to interface our different Ethernet LANs." The fact that FDDI was a standard solution was "highly significant," Riddle says, because it gave him hardware flexibility. However, he is still waiting for Fibronics to develop some additional network management software that will further enhance the backbone.

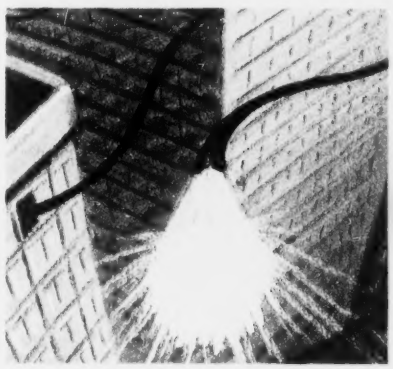
Network Management Is Key

The unique architecture of LANs provides special advantages for passive network management at a modest price. On most LANs, data pass by every station. By simply putting software on any computer on the LAN, traffic can be passively monitored as it passes by.

When a backbone LAN is installed, network monitoring can be extended across every individual network on the system. (Individual networks are referred to as either "subnetworks" or "front-end" networks.) This is accomplished by putting monitoring software in the bridge between the subnetwork and the backbone.

Because the bridge is connected on one side to the subnetwork and on the other side to the backbone, it can monitor activity on the subnetwork and pass the information to a single network management station residing on the backbone itself or on any subnetwork within the overall network. Monitoring each subnetwork in this fashion makes it easier to expand the capacity of subnetworks and the backbone gracefully.

Right now, Riddle is waiting for Fibronics to deliver the ability to monitor traffic on his subnetwork Ethernet LANs before he commits to installing FDDI as the backbone for all NASA Langley's Ethernet LANs.



Riddle's experience at the NASA Langley installation gets to the heart of an important issue: How far does the FDDI standard reach? In theory, FDDI's station management capabilities allow active network management. This means that it is possible to track network use and query the status of every FDDI node on the network, which is important in determining the location of specific faults. But SMT does not readily extend itself to other LANs, such as AppleTalk, Ethernet or Token Ring. In essence, users will still require a proprietary network management scheme, such as the pending Fibronics solution, to track the status of all subnetwork LANs.

A Potential Glitch

This seemingly tiny hole in the FDDI standard adds a potential glitch to its value as a standard for corporate backbones. By using custom software from an FDDI vendor to provide any important feature, an end user could inadvertently end up locked to that one supplier.

Riddle say that, although the issue of monitoring his subnetworks is important, this current FDDI shortcoming is not enough to keep him from using the new standard. "I don't want to accidentally negate the value of the standard and also don't want to get locked into a single vendor," he says. "We'll have to hope that we get standard NMS [network management system] software as the market develops."

A standard solution may not be too far off. "Once FDDI gets going as a corporate backbone," says Information Resource Development's Bosomworth, "enterprising people will figure out how to extend its management capabilities. Over the short term, we'll probably see third-party software that extends SMT into Ethernet and other LANs. Over the long term, we may see SMT become a part of both Ethernet and Token Ring, as well."

On the Front Lines

Although most analysts expect FDDI to become the standard for LAN backbones, there is considerable controversy about another role that FDDI is expected to play—linking high-speed graphics workstations and minicomputers or mainframes directly together at 100Mbps.

The leading workstation companies—including Apollo Computer Inc., Digital, Hewlett-Packard and Sun Microsystems—are expected to ship FDDI products this year. We can also assume that FDDI is in the cards for IBM's hot new workstation, the RISC System/6000.

The problem is that a number of observers don't believe FDDI has enough horsepower to meet all the demands of graphics workstations. According to Frank Dzubeck, president of Communications Network Architects Inc. a consulting firm in Washington, D.C., FDDI cannot adequately service high-end workstations that process rotating 3-D graphics. To do this properly, Dzubeck claims, a minimum of 148Mbps bandwidth is required; otherwise workstation performance degrades.

☐ THERE ARE SERIOUS QUESTIONS REGARDING HOW FAR FDDI WILL BE ABLE TO GO.

Tim Kuhfuss, an assistant computer scientist at Argonne National Laboratory in Argonne, Ill., agrees. Kuhfuss, who is testing FDDI, says, "A number of our researchers have said they'll need something like a gigabit for applications such as scientific visualization of images."

Still, Dzubeck and Kuhfuss also agree that, while FDDI won't meet every need, it will certainly address the needs of many users. Dzubeck expects to see higher speed proprietary LANs that will meet the limited demand not met by FDDI. These higher speed LANs, he says, will be linked to an FDDI backbone and will simply slow down when graphics have to be transferred across the backbone.

Watch Your Wallet

Although most problems people seem to have with FDDI lie at its periphery, one problem cuts to the core: price. Today, a typical FDDI node sits in the $10,000 range, which is pricey even for a backbone. Fortunately, everyone expects the price to drop rapidly when new products flood the market later this year.

John Jaeger from AMD expects the price of backbone connections to fall at least to the $4,000-to-$6,000 range within a year, and possibly down to the $3,000-to-$4,000 range. By 1993, Jaeger expects that connections will be priced in the $2,000-to-$3,000 range and by 1995 will be under $1,000.

"The price makes a big difference," says Kuhfuss, although he couldn't say precisely what price would justify FDDI because different applications have different cost justifications. But, he says, once FDDI reaches below $3,000 for an interconnection to a backbone or to a workstation the standard will become "very attractive."

☐ Everyone Expects The Price To Drop Rapidly Later This Year.

The bottom line on FDDI is that after seven years of development by committee, this is the first year in which FDDI will become an operating reality. Despite a major push from vendors, there are serious question regarding how far FDDI will be able to go in the marketplace.

How far and for how long FDDI will meet the needs for graphics workstations is a big question that cannot be answered until products reach consumers. It's even more uncertain whether business users will replace their front-end Ethernet, ARCnet and AppleTalk LANs with FDDI. To do so will require not only pulling fiber to every desktop but also making a substantial investment in every workstation in the form of new interface boards. For these reasons alone, FDDI may never advance much beyond being a backbone.

So FDDI is not going to be everything to everybody. "FDDI does not excite us," maintains John Leong, networking director at Carnegie Mellon University in Pittsburgh. "An order of magnitude increase from 10Mbps to 100Mbps at this point in time is just not exciting." But with dozens of companies readying products for something that has the ANSI seal of approval, it's a safe bet that FDDI is going to play a huge role in the future of corporate LAN backbones and a significant one for front-end LANs that need more oomph than Ethernet. ▭

Stephen A. Caswell has more than 15 years' experience writing about data communications. He is based in Westlake Village, Calif.

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A Proprietary Faith For Midrange Users

With some exceptions, mainly at the low end, most European users of midrange systems continue to follow their existing suppliers' proprietary operating systems doctrine.

BY JAMES ETHERIDGE

With most midrange hardware and software in Europe running proprietary operating systems, users are remaining largely faithful to their regular vendors. Nonproprietary alternatives, such as UNIX, are making converts largely at the low end of the midrange system market.

The main vendors competing for the general-purpose midrange systems market in Europe include two major indigenous players (led by Siemens AG and Groupe Bull) and three U.S. giants (Digital Equipment Corp., Hewlett-Packard Co. and IBM). These vendors and dozens of other, smaller suppliers should find the competition heating up if midrange systems sales slow to the expected snail's pace and the proportion of information technology budgets devoted to these systems falls sharply.

Midrange systems accounted for only 18.5% of total European information technology spending in 1988, according to International Data Corp. The Framingham, Mass., market research firm defines midrange systems as those selling for between $100,000 and $1 million. A similar proportion of European IS dollars (18%) was spent on small systems, according to IDC (those costing between $10,000 to $100,000), 20% on mainframes and a whopping 43.5% on micros. Valued at $7.5 billion in 1988, total European sales of midrange systems accounted for 35% of the $21.5 billion worldwide market, according to IDC's numbers.

Sizing Up the Market

Indeed, the midrange systems market in Europe, like that for mainframes, is basically a renewal market now, says Guillaume Tostain, research manager at IDC France. IDC France predicts that sales of midrange systems will increase at a sluggish 2% annual rate between now and 1993. Hence, the midrange segment's market share is forecast by IDC to fall to 13% by 1993, with the mainframe share similarly dropping to 14%, small systems edging up to 19% and micros soaring to 54%.

Midrange systems cannot even be sure of preserving their identity since "they are being challenged by small systems and top-of-the-range micros," says Tostain. "Niche players like Tandem have a brighter future than most. . . . Some midrange vendors will disappear."

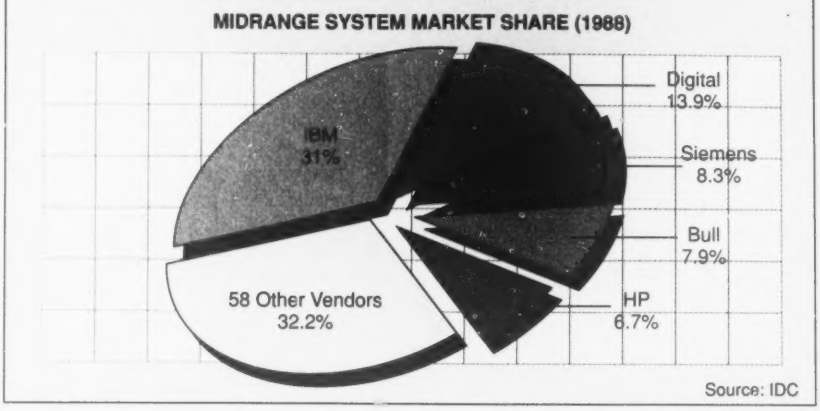
Of the vendors leading the pack today, IBM, of course, dominates with a 31% share in 1988, followed by Digital (13.9%), Siemens (8.3%), Bull (7.9%) and HP (6.7%), according to IDC. Fully 58 other vendors are vying for the other 32.2% of the market led by Tandem Computer Inc., Unisys Corp. and Wang Laboratories Inc.

IDC's Tostain says IBM will probably cling to its dominant position, especially as the AS/400 is selling so well. The popular midrange system's success may be due largely to IBM's adherence to its proprietary faith rather than heeding the call of the vociferous UNIX congregation. "The strategy of IBM and others has been to put the emphasis on [proprietary] software by concluding contracts with developers," Tostain points out. In doing that, he adds dryly, "IBM was able to get away with launching a major new mini running on a new operating system that is not UNIX." The AS/400 launch was also

BP ENGINEERING'S BYLETT: His group stayed with VAX for its inhouse accounting system, as it provided automatic backup for the system's hardware.

Europe's Biggest Keepers of the Faith

In 1988, IBM dominated the market for general-purpose midrange systems, define as those priced between $100,000 and $1 million.



aided by the good migration path IBM built from the System/38, Tostain explains.

The proprietary AS/400 attracted the big Paris-based industrial conglomerate, PÄchiney SA, despite the fact that the company took a different migration path, moving from the System/36. Posting revenues of Fr89 billion ($13.9 billion) in 1989, this diversified multinational, whose activities cover aluminum smelting, nuclear power, packaging and electrometallurgy, has a highly decentralized corporate ethos. Its 250 manufacturing and commercial units around the world have considerable operational autonomy, although many sites are not very large.

Reducing Suppliers and Costs

That corporate style is reflected in the conglomerate's midrange IT strategy, which distributes the data-processing burden among a multitude of midrange systems at the local level rather than concentrating it in a central site. "We have a policy of decentralization and distribution, with coordination at the center," explains Pierre Dubarry, group general manager of information systems. "That way, we can keep the number of suppliers down and reduce our costs by centralizing purchases from our three main suppliers for the whole group."

The Big Three suppliers for PÄchiney are IBM, Digital and HP, which account for 65%, 25% and a little under 10%, respectively, of the company's administrative systems. When it comes to industrial systems, however, 65% are Digital and 30% HP.

PÄchiney operates an international network, managed at the central site by an IBM 4381, to which the remote sites are connected through workstations and micros for data transfer to and from the central site. Databases are essentially decentralized, using native database management systems supplied by the hardware vendors. Software development is kept to a minimum: "We have a packaged software approach where possible, especially for general administrative applications," says Dubarry.

Dubarry has no complaints about proprietary operating systems per se. Most companies in the conglomerate use just one supplier, so there aren't any multivendor environments at individual sites requiring different makes of hardware to communicate with each other. As far as Dubarry is concerned, the group has made firm choices of suppliers for the foreseeable future, and he doesn't feel any desire or need to diversify hardware or introduce a unified operating system for greater applications portability. "Our big challenge over the next three years is how to interconnect our midrange systems with the micro networks that are beginning to be installed," he says.

A company like PÄchiney that has grown partly by acquisition is bound to have inherited a mix of systems along the way. The company's current more limited choice of vendors was the result of a rationalization process. Some years ago, PÄchiney had some small mainframes from Bull, but dissatisfaction with the French computer maker's hardware during its difficult renaissance in the early 1980s caused PÄchiney to eliminate all Bull systems. Although Bull is now a more credible and reliable supplier of systems that correspond to PÄchiney's requirements, Dubarry has no intention of going back on his decision, implying that Bull has missed the boat and that the group is committed to its chosen vendors over the medium term—the next one to three years.

> ☐ THE STRATEGY OF IBM AND OTHERS HAS BEEN TO PUT THE EMPHASIS ON SOFTWARE.

The Devil They Know

Most companies naturally favor the devil they know over the devil they don't when it comes to choosing a new system. In fact, for users like Dubarry and Brian Bylett, chief accountant at BP Engineering, a London-based subsidiary of BP International Ltd., proprietary midrange operating systems are anything but a constraint. As IDC's Tostain points out, they "already have many applications up and running, and they are developing new ones that are compatible with existing applications since they run on the same operating system."

BP Engineering, which provides engineering services of all kinds to its parent, chose to run its new accounting software on a Digital system because the company's engineering operations were already VAX-based. Until recently, the company's accounting was handled by BP International's central accounting department, which used the IBM-based Millennium accounting software from McCormack & Dodge Corp. In 1985, BP Engineering decided to set up an in-house system. As Bylett explains, the group decided to stay with VAX so automatic backup would be available should the accounting system's hardware go down.

"The VAX hardware still left us with a reasonable choice," maintains Bylett. Having looked at three packages—the Integrated Accounting System from Coda Ltd. of Leeds, U.K.; another package from the Dublin-based G.C. McKeown; and McCormack & Dodge's GLPlus—Bylett quickly opted for Coda's system. It was originally developed to run on HP hardware, but was subsequently redeveloped for the VAX and is being adapted for IBM systems.

"What swung it was the way it's arranged, as software within software," says Bylett. "It uses ISLink to enable Coda to be integrated with your existing software, so there is a good interrelationship. And you can simply install upgraded versions without any problem. Secondly, it struck us as being a system conceived by accountants for accountants and not by systems analysts for systems analysts. . . . And, in general, it is user friendly, and people can be easily trained to use it."

Four people spent nine months developing the new accounting system in 1986, and it went live in 1987. A VAX

8200 was acquired to run it originally, but it has since been upgraded to a dual-processor 8350 to which 35 terminals are connected and which also handles batch processing. Bylett's only complaint has to do with data access. "It has to go through certain routes, and we would like more efficient access to data." But help could be on the way. "A relational database version of Coda's system will be available soon, which could be interesting." He wasn't aware that one was in the pipeline when he made his original choice.

Where UNIX Fits In

UNIX, the potential alternative to the proprietary route, "hasn't really taken off in this market," says IDC's Tostain. "DEC and others are coming 'round to UNIX now, but that's still not enough to replace systems using VMS and other proprietary operating systems," he says. UNIX has only eaten into the bottom end of midrange systems: "The low-end AS/400s, in particular, have lost out vis-à-vis UNIX systems."

Most vendors, Tostain asserts, have only made tentative steps towards UNIX, and predominantly at the small-systems level. "Bull gives users the chance to replace small systems by UNIX, but not midrange systems."

Indeed, Bull has been busy lately expanding its GCOS 7 operating system to give users even fewer reasons to opt for an alternative such as UNIX. Not only has Bull launched an improved top-end model, "the most powerful system ever developed in Europe," as the company modestly puts it, but it has also added a lower entry-level model, giving smaller sites access to GCOS 7.

Among the exceptions to the proprietary trend are HP and Siemens. In struggling to take market share away from IBM, HP has embraced UNIX, especially for its new systems based on reduced instruction set computing (RISC), even though it thinks its proprietary system, MPE-XL, gives up to 50% better performance. In pushing both UNIX and MPE, HP believes it is backing two sure-fire winners because, as HP vice president William Roelandt says, MPE will become the standard for transactional processing.

Siemens, too, is providing midrange users with the UNIX option. At Datenzentrale Schleswig-Holstein, a computing center providing services to the public administration of the Schleswig-Holstein region in West Germany, the head of planning and organization, Hartmut Niesing, is converting the operating system on his entire stock of Siemens BS 2000 minis. The minis, most of which still run the vendor's own Amboss operating system, will be converted to Siemens' XENIX 500 over the next five years.

The center has pursued a highly decentralized strategy over the past 15 years, downloading computing power to the individual public service administrations (hospitals, police force, passport administration, car registration, etc.) in the region. The central site, equipped with IBM 3084 and Siemens DS 2000 mainframes, has expanded over the period to manage the big centralized database, the electronic mail system (both among various remote sites and between the remote and central sites) and on-line applications.

☐ For Many Users, A Proprietary OS Is Anything But A Constraint.

But the big increase in power has taken place at user sites. Some 200 Siemens BS 2000 minis, models C30 and C40, are scattered around, each connected to between 10 and 100 terminals and "loosely coupled to the central hosts, in particular for data transfer at night," says Niesing. The purpose, Niesing says, is to provide good response time and good availability, which he views as the great merits of a decentralized structure. "It's a question of motivation for end users. They like to have processing power in their own hands," he says. Still, the Datenzentrale plays a strong coordinating role in selecting the main hardware to be used locally and developing applications for users. "We develop most applications ourselves, as public administration has very specific hardware requirements."

One of the reasons for going over to UNIX, Niesing says, is to take advantage of some standard applications in the market for office automation spreadsheets and word processing. The main reason, though, is greater independence from the vendor. "We couldn't change hardware or mix systems before. We were locked into Siemens."

The center is converting to UNIX over a seven-year period, with all Amboss applications being gradually converted to XENIX 500. The shift will entail an upgrade in hardware-processing capacity, enabling more terminals to be connected to distributed systems and more applications to be downloaded to the larger user base. It should go hand in hand with particularly strong growth in office automation applications.

PÄchiney's Dubarry is not convinced, though. "We are keeping an eye on UNIX, but it is not at all generalized at the moment, and no extension is planned in the immediate future. There isn't as much packaged software available as we would like. But in the future it could be a means of breaking down barriers within companies." ▭